S/F/59

J.I.C./519/61

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Copy to:- Mr. B.T. Price, Ministry of Defence

SECRET ATOMIC ACTIVITIES IN ISRAEL
(Previous reference: J.I.C./2023/60) 149

At your meeting on 1st December, 1960 (J.I.C.(60)60th Meeting, Item 9) you invited the Joint Intelligence Bureau to prepare an assessment of Israeli intentions and capabilities in the light of intelligence received about the Israel nuclear programme. 143

2. The attached draft has been prepared by the Joint Intelligence Bureau and will be included on the agenda of a suitable meeting of the Committee.

(Signed) J. J. B. HUNT

27th March, 1961

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Annex to JIC/519/61

SECRET ATOMIC ACTIVITIES IN ISRAEL

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Appendix B:	The capacity of the Beersheba reactor to produce military plutonium.
Appendix C:	A selection of Israeli and French statements relating to atomic activities in Israel.

SECRET ATOMIC ACTIVITIES IN ISRAEL

Summary and Conclusions

This paper reviews the intelligence so far gathered as a result of that there might be an atomic site near Beersheba in the Negev Desert in Israel. The information about the site has now been amplified, and, in addition, some Israeli importing activity with significant implications has been brought to light. Our information about plans for French atomic aid to Israel suggests that these may have been more extensive than has been admitted. It is possible that in the pre-de Gaulle period the French were prepared to go further than they are now. A number of links are found to exist in Israel between atomic energy and the Ministry of Defence, and various Israeli statements relevant to Beersheba are found not to have told the full truth.

The paper concludes that Beersheba is indeed an atomic site and represents the start of a wider atomic programme which may well have included plutonium production. It is found that the Israelis tried to cover up these activities by secrecy and by deception. It seems more likely than not that the Israelis were trying to put themselves in a position to make a nuclear weapon should they decide to do so, though no development of her present programme could produce an Israeli nuclear device before 1964.

Finally it is concluded that

There are three Appendices to the report; one examines the capacity of a reactor at Beersheba to produce military plutonium; a second presents a diary of events relevant to the subject of the paper; a third summarises important Israeli and French statements.

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SECRET ATOMIC ACTIVITIES IN ISRAEL

In September of last year the United Kingdom Embassy at Tel Aviv reported that there might be an atomic site near Beersheba; and this report was backed up by some

As a consequence of the Embassy's report, an

2. The evidence so far gathered presents an involved and far-reaching picture which we cannot claim to understand fully. The central feature of the picture is a sizeable atomic research establishment, but beyond this, though obscurely marked, the outlines of some larger programme are discernible. A marked feature of the picture is the extreme secretiveness displayed by the Israelis. It should be borne in mind in considering this paper that the entire story represents in effect a second Israeli atomic programme which has been going on behind the cover of a small and quite innocuous research programme centering round the Weizann Institute. This Weizmann Institute programme was represented by the Israelis as the limit of their atomic effort.

3. This report that follows discusses what we have learnt under five heads. In Appendix A, following the conclusions, we have presented a chronological table of the whole story and included a number of smaller points not considered in the main report.

The Beersheba Site

4. The Beersheba site by which attention was originally attracted is located in the Negev Desert, about half-way between Beersheba and Sodom. The closest locality to the site is in fact the small town of Dimona.

5. and of various Israeli admissions, we now believe that this site includes:-

(a) a natural uranium/heavy water reactor, about half-completed; the Israelis say it is to be a research reactor with a thermal rating of 24 megawatts;

(b) a laboratory for radio-chemistry;

(c) a laboratory for conventional chemistry;

(d) supporting facilities of various kinds including a medical unit, a library, and two substantial work-shop or storage buildings;

(e) further buildings of an unidentified nature under construction.

We think it likely that the existing laboratory buildings, which are large, contain more laboratories than the chemical laboratories of which we know. On the other hand, we are confident that the site does not at present include, either a second reactor of any significant size, or an industrial-scale plant for the seperation of plutonium. We estimate that development of the site began in 1957; and that it has cost between five and ten million pounds.

6. Essentially what such a site as that described represents is an atomic research establishment of the type any country might build as the foundation of an atomic programme, irrespective of how that programme was later intended to develop. There are, however, three features about Beersheba which attract suspicion. The first is that it was built clandestinely; the second is that have linked the site to defence purposes; the third is that the reactor looks rather larger than one would expect Israel to be building at this stage. Given certain conditions, which are fully discussed in appendix B, the Beersheba reactor might be able to provide

a small quantity of military plutonium.

Israeli imports of atomic interest

7. Less prominent than the Beersheba site has been the purchase, or attempted purchase, by Israel of materials of atomic interest.

and are unable to say what we have learnt represents the whole story or only part of it.

8. The main Israeli achievement in the importing line relates to 20 tons of heavy water, part of a lot of 25 tons which the United Kingdom Atomic Energy Authority had contracted to buy from Norway and later found to be superfluous to their requirements. The Norwegians were not willing to cancel the contract to supply the water, but were willing to try to find an alternative customer; and in, or shortly before, February 1958, Israel was found to be such a customer. Subsequently, September 1958 negotiations were undertaken whereby the water ultimately passed into Israeli hands, the actual shipments taking place in mid-1959 and mid-1960.

9. The heavy water transaction was characterised by the extreme secrecy on which the Israelis insisted; and another noteworthy point was their obstinate resistance to the idea of safeguards. After much argument, a provision about peaceful uses was included in the Norwegian-Israeli Agreement covering the sale of the water; but the safeguards were not stringent, nor was the Agreement ever registered with the I.A.E.A. Indeed, the very purchase of Norwegian, rather than American, heavy water is in itself suggestive. American heavy water was available and would have been very much less expensive - a point that would have been welcome

to the Israelis, since shortage of funds caused them to accept the 20 tons they bought in two separate financial years rather than all at once, and was also probably responsible for their taking 20 tons rather than the full lot of 25. The purchase of American heavy water would, however, have been likely to involve publicity and strict safeguards; and presumably this is what the Israelis were paying extra money to avoid.

10. At about the time of the heavy water deal the Israelis were also attempting to purchase from South Africa 500 tons of contained uranium to be delivered over a ten-year period. Here once again the Israelis evinced a strong distaste for safeguards, though when the South Africans stood firm they suggested that they might sign a safeguards clause on condition it was not enforced. Ultimately, the Israelis broke off these negotiations, leaving the South Africans with the impression that they had found another supplier.

11. A small but possibly significant transaction was the purchase by the government of Israel, in 1957, of a chemical which has particular application in the extraction of uranium and plutonium. In 1958 the Israelis were considering buying reactor parts in Norway: so far as we know, nothing came of this. Currently we know that they are investigating the possibility of buying uranium from a South American country.

12. These scattered instances of imports, or attempted imports, do not enable us to judge what atomic plans lay behind them. The one transaction clearly likely to relate to Beersheba is that involving the heavy water. The amount of water in question could well be utilised in a reactor of the power declared (though it would also suffice for a more powerful reactor); and there is a coincidence of the dates

relating to the heavy water with the timescale of the reactor. On the other hand, the 500 tons of South African uranium would certainly not have been required for a 24 MW research reactor such as that alleged to be being built at Beersheba. Such a large amount could only find a use if some additional or larger reactor were then in mind; or if it were planned to make military plutonium by frequently changing the fuel elements of a reactor. (See Appendix B). Probably the best general comment that can be offered on the Israeli atomic imports at this stage is that it is surprising to find the Israelis wanting such imports when they already had a far-reaching atomic agreement with France.

Franco-Israeli Atomic Relations

13.

14.

He told us that there was a Franco-Israeli atomic agreement dating back to 1956 and that the French were helping to build an atomic site including a "powerful" reactor at Beersheba.

15.

He alleged that the training of Israeli specialists under the agreement had included visits to Marcoule, which is not a research centre but the site at which France's military plutonium is made; that drawings of a G-3

reactor (the latest Marcoule type) were sold to the Israelis in September 1957; that a number of French firms set up dummy subsidiaries specifically to supply Israel with atomic equipment; and that the Israelis had asked (in vain) for a visit to the French nuclear weapons establishment. He also said that knowledge of these arrangements was restricted to a very small number of people in France and that the present French Foreign Minister was not one of them until late 1958.

16. If the allegations are true the Franco-Israeli agreement begins to look like something wider than an agreement for peaceful research. In particular the story of the G-3 drawings, if correct, strongly suggests that the Israelis were interested in the production of plutonium. As to how much further the G-3 project went beyond the supply of drawings we have unfortunately no information. There is clearly no G-3 at Beersheba, either complete or in any advanced state of completion; but we cannot rule out that some of the new buildings going on at the site may represent a G-3 in the early stages of construction, or that a G-3 may be being built at some other secret site in Israel. It is also possible that the Israelis are holding this project in reserve.

17. Our second main source is the French Foreign Minister himself. His main contribution is an assurance, given to the United States Secretary of State, that French aid to Israel was limited to the Beersheba reactor and that the plutonium from it would come to France. The first of these points does not, of course, explain the allegations of about the G-3 drawings; but we think it most likely that what M. Couve says is correct now but may not

always have been so. It might be, for instance, (this is pure speculation) that the coming of the de Gaulle regime, or the acquisition of the heavy water, caused some modification of Franco-Israeli atomic plans in the period 1957-58. M. Couve's second point about the plutonium reverting to France is not easy to reconcile with Israeli interest in acquiring uranium; it is also expressed in a slightly different way from a comment of the Israeli government on the question of the fuel elements. What the Israeli government said was that "the country supplying the fuel elements would get the plutonium" and such a position would presumably mean that if the Israelis themselves made fuel elements then they would get the plutonium. (This is the position that has already arisen over the Canadian-Indian reactor at Trombay). Altogether, if Mr. Couve intended to be completely reassuring, one could wish that he had provided a fuller account of what had gone on.

Atomic Associations of the Israeli Defence Ministry

18. In the case of Israel there are a number of links between atomic energy and the Ministry of Defence which seem worth noting in the present paper. Both fields come ultimately under Mr. Ben Gurion, since he is both Prime Minister and Minister of Defence, and since atomic energy is administered under the Prime Minister's office. At a somewhat lower level the Chairman of the Israeli Atomic Energy Commission (E.D. Bergmann) also occupies an advisory post at the Defence Ministry; and the Ministry turned up again in connection with the small and overt reactor of the Weizmann Institute which turned out to have been built by the Ministry of Defence. Finally, several independent sources have linked

Beersheba to defence aims, and one of them (the prospective director) described it as a "university" of the Ministry of Defence.

19. though it is clear that they believe in maintaining strong defences and in procuring the best weapons available. In 1959 the question of acquiring nuclear weapons appears to have been discussed in Israeli government circles. We may note that Shimon Peres, who was at that time a protagonist for the weapons, has stayed on as Director General of the Defence Ministry whereas Major-General Tolkowsky, then Chief of Air Staff, who opposed them, has now retired; but

us to know how much weight would be given to these points.

Israeli Statements relevant to Beersheba

20. If the Israeli government had been able so to arrange matters, the activities we are considering would have remained quite unknown. They tried their best to keep the Beersheba site secret by suppressing references to it, by putting "Soil Research Institute" on a board by the entrance road, by discouraging observers and by giving untrue answers to enquiries from the British and United States Ambassadors. It appears that the

who was recently sentenced to five years imprisonment on secret security charges,

21. On a number of occasions, however, the Israelis have had to come some way into the open. One occasion was at the time when they opened negotiations with a Norwegian firm about the heavy water. They appear to have told the Norwegians

at this time that they wanted to build a reactor in order to recover minerals from the Dead Sea and to make some plutonium; later there might be another reactor of the same (i.e. heavy water) type which would provide power. The "minerals from the Dead Sea" is unlikely to be true; the story as a whole, however, suggests that the Israelis did have some definite plan of atomic development in mind in 1958 and that the plan involved plutonium. All this does not agree too badly with the story of the South African uranium.

22. When the existence of the Beersheba site became known, it was inevitable that the Israeli government should make some comment. (If we are to believe the

the French had become uneasy about the secret nature of their collaboration on atomic affairs with Israel, and had been urging the Israelis since about mid-1960 to agree to a joint communique). The Israeli statement, when it finally came, was made by the Prime Minister himself. It admitted the existence of the reactor; it denied any military aim; it suggested, rather cloudily, that "arid zone research" was involved and that later there might be a power reactor. Essentially Mr. Ben Gurion's statement bears the same character as the French Foreign Minister's assurance (paragraph 17 above). Both of them were too short for the situation that had arisen and left too many questions unanswered. The suggestion of "arid zone research" recalls that a "Negev Research Institute" was set up in Beersheba at about the time the atomic site was activated. We have been unable to find out much about this Institute and the possibility is open that it equates with the site that has attracted our attention and that some genuine "arid zone

research" goes on there. However that may be, we find it hard to believe that a 24 MW reactor has any immediate relevance to such research and we class Mr. Ben Gurion's suggestion with the tale of recovering Dead Sea minerals which was offered on an earlier occasion.

23. Subsequent to Mr. Ben Gurion's statement, the British and U.S. Ambassadors independently submitted questions about Beersheba to the Israeli government. In replying, the Israelis gave a clear assurance in each case that they had no plans for making nuclear weapons. On various other points, however, the Israeli replies evinced the same nebulousness and lack of completeness that have marked their earlier statements on this subject. The replies as a whole did not add singificantly to the known facts and have failed to alleviate British misgivings. Two of the British questions left quite unanswered related to whether Israel planned to seperate plutonium and the source of the money for Beersheba. (A selection of Israeli and French statements relevant to Beersheba is provided at Appendix C).

Conclusions

24. Three conclusions are easily drawn:-

(1) that the Israelis have built at Beersheba a complex of which the primary function is atomic research;

(2) the Israelis were looking beyond Beersheba to further atomic developments which may well have involved plutonium production;

(3) the Israelis have tried to cover these activities by strict secrecy and by deception.

25. On the central issue of the purpose of these activities we are less confident. We find it hard to believe that the

Israelis would have pursued their atomic programme in quite this way had their purposes been purely peaceful. On balance we think it more likely that they were trying to put themselves in a position to make a nuclear weapon.

26. As for Israel's ability to make a nuclear weapon, we do not think that an adequate amount of plutonium could be made at the Beersheba site until at least three years from now, even supposing that the Israelis still find it practible to develop this site as they wish. On top of this three years a further period of six months or more would be necessary before a nuclear device could be made. If the present Beersheba reactor remains the sole source of plutonium, the production rate of weapons could hardly be pushed higher than three a year, even supposing that the reactors thermal rating could be substantially increased. Thus, barring the possibility of there being yet another secret Israeli atomic site containing a further reactor, and we do not think this is likely,

27. A last conclusion, following from those above, is that we think that

APPENDIX A.

DIARY OF EVENTS AFFECTING THE SECRET ATOMIC ACTIVITIES IN ISRAEL

1956 (Communist bloc supplying arms to Egypt; France supplying arms to Israel).

Soviet-Egyptian atomic agreement, including construction of a small research reactor; France-Israeli atomic agreement, including construction of a "powerful" research reactor plus, possibly, a Marcoule-type reactor.

1957 Israelis at Marcoule and Saclay under terms of agreement with France; in September drawings of a G-3 reactor are sold to Israel; dummy firms set up to make possible secret supply of atomic equipment to Israel.

Development of Beersheba site begins.

"Government of Israel" purchases in London small quantity of a chemical which has particular application in the recovery of uranium and plutonium.

1958 "Negev Research Institute" established at Beersheba; this may or may not equate with the reactor site.

Haifa Technical Institute expands nuclear training; facilities include a reactor-simulator.

Israel trying to procure 500 tons of safeguard-free uranium in South Africa.

February: Israel expressing interest in the 25 tons of heavy water.

(May: Downfall of Fourth Republic in France may have affected Franco-Israeli atomic dealings).

September: U.K. Atomic Engergy Authority and a Norwegian firm negotiate about disposal of the heavy water to Israel.

1959 Israel government circles discuss acquisition of nuclear weapons.

February: Agreement signed in Oslo about sale of heavy water. Israelis have reduced their demand to 20 tons and have made difficulties about safeguards. However a provision about peaceful uses is incorporated in agreement.

July: Ten tons of heavy water shipped.

1960 Mid-year: France pressing Israel to agree to a joint communique on atomic affairs; the Israelis resist this proposal and the French resort to sanctions to get it accepted.

June: Balance of heavy water shipped.

Professor of Physics at Haifa Technical College arrested about now on security charges. Subsequently it appears that he has been in contact with the Czech Intelligence.

The Israelis entertain leading scientists from many countries at a conference at Rehovoth. Their overt atomic programme, associated with the Weizmann Institute, is put on display as representing the entire Israeli atomic effort.

August: U.K. Embassy, Tel Aviv, reports on the Beersheba site.

October: Suggestion by Bergmann, head of Israeli A.E.C., that Israel should acquire the first fuel charge of a Norwegian reactor (Halden) which has been only slightly irradiated; also that the heavy water should be loaned back to Norway since Israel would not need it for two years. Nothing comes of either suggestion.

October/December: Trial in camera of the Haifa Professor who is later sentenced to five years imprisonment.

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November: Yehud Avriel, a high-ranking Israeli government servant with Intelligence experience, expected to become head of a secret "Defence University" near Beersheba.

November/December:

that a Franco-Israeli communique on atomic affairs is impending.

a series of briefings and shortly afterwards references to a "new atomic power" appear in the Washington press. These references are picked up and associated with Israel by the British press.

December: Israeli Prime Minister makes brief statement admitting existence of Beersheba reactor.

Proposal that Israeli scientist should visit Harwell to study plutonium. The proposal is not accepted.

Israel interested in importing uranium from a South American country.

December/January 1961: U.K. and U.S. Ambassadors in Tel Aviv independently take up with Israeli government questions arising from the Beersheba story. Each is assured that Israel is not making nuclear weapons; but neither is given a fully satisfying answer to his question.

APPENDIX B

THE CAPACITY OF THE BEERSHEBA REACTOR TO PRODUCE MILITARY PLUTONIUM

A 24 MW research reactor, which is what the Israelis claim to be building at Beersheba, is capable of producing small but significant amounts of plutonium. Whether it does or not depends upon how it is used. The research programme associated with it could result in frequent fairly long periods of shut down or of lower power operation, in which case nothing like the full potential would be achieved. On the other hand, some research reactors have been run at an average of up to 80% of their full rating throughout the year. This would be the case either if the research programme was particularly favourable to intensive operating or if the research programme were a secondary consideration.

If we assume intensive operating, the reactor could produce up to about 5 KGS of plutonium per year. Thus enough could be acquired in two years running to provide comfortably for a first test.

However, it is certain that if a nuclear test is the objective, the irradiation time of the plutonium in the reactor will have to be kept to a fairly low level to prevent the formation of an unacceptably high percentage of Pu-240. If this is not an important consideration, the reactor could run purely for research purposes for up to two or three years on the first charge of fuel elements. If, on the other hand, the plutonium is to be in a suitable form for use in the kind of weapon the Israelis may be able to design, the fuel elements would need to be changed at intervals of 4 to 6 months.

It is, therefore, clear that if the Israelis are to remain dependent on the French for the fuel elements, they cannot use it to embark on a weapons programme without the knowledge and, indeed, the connivance of the French. The Israelis could escape from this situation by making alternative arrangements for the supply of fuel elements at an adequate rate and undertaking their own chemical processing of these elements after irradiation.

One possibility that should not be overlooked is that 24 MW may not in fact be the true rating of the reactor. This is the rating given in Mr. Ben Gurion's statement: but though the 20 tons of heavy water which the Israelis bought could well be used up in a 24 MW reactor, they might also suffice for a reactor of up to three times that power. The possibility of the reactor design undergoing modification has indeed been mentioned to the British Ambassador since Mr. Ben Gurion's statement, and if these modifications affect the reactor power, they would hardly reduce it. If the Beersheba reactor is, in fact, intended to have a rating of, say, 60 MW, it could provide military plutonium for up to three weapons a year.

Policy and Aims	Activities and Methods	The Beersheba Site
A. Before December 1960		
Isreal has uranium deposits, and wants a heavy water reactor to help recover Dead Sea minerals and to produce plutonium. Nuclear power for Negev irrigation may come later. (Israeli AEC, September 1958)		Site described on board at entrance as "Soil Research Institute - Private Road, No Entry".
Scientific research in Israel is too theoretical. We are trying to obtain a secret weapon which is now available to some countries. (Director-General, Israeli Ministry of Defence, February 1959).		
Atomic energy will be a practical possibility for Israel as a basis of power production. Since 1948 we have planned to use our own natural U, and heavy water. but economic feasibility depends on developing use for plutonium - potentially a reactor fuel. (Israeli AEC, August 1960)		Israeli General describes site as "new factory being erected in order to produce manganese". (September 1960)
B. December 1960 - February 1961		
Israeli Government has decided it would be folly to make a nuclear weapon. (Head of P.M.'s Office)	Israel is going to produce uranium, but only a ton or two per annum, experimentally. She has not yet got fuel for Beersheba reactor, and the country supplying the fuel will get the plutonium back. (Israeli Foreign Ministry)	The Negev reactor (24MWT, natural-U heavy water) is part of a site devoted to scientific, industrial, agricultural and health purposes. It will require something like fifty times as much uranium as Israel might produce from her own phosphate rock. (Ben Gurion)
Israel is not "well on the way to making a bomb". Her industry is not at present capable of undertaking such a task. (Israeli AEC)		

Policy and Aims

Reports that Israel is making a bomb are false. We have no plans for production of nuclear weapons. Negev site is devoted to purely peaceful purposes.
(Ben Gurion)

Isreali Government would consider producing weapons only if a change of circumstances made this a necessity.
(Israeli Foreign Ministry)

Activities and Methods

On learning (1958) of 1956 Franco-Israeli agreement, the present French government started to negotiate safeguards. Those which have now been agreed are adequate, and include inspection.
(French Foreign Minister)

French assistance is limited to 24 MW research reactor, to be supplied under arrangements which ensure exclusively peaceful use.
(French Foreign Ministry)

The Beersheba Site

The Negev site is for research, not power production. It will expand, and may eventually include a university.
(Isaeli Foreign Ministry)